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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,075	09/05/2003	Eun-Kyoung Go	3364P133	8338

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EXAMINER	
SHAH, PARAS D	
ART UNIT	**PAPER NUMBER**
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/656,075	GO ET AL.	
	Examiner	Art Unit	
	Paras Shah	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/05/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/05/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is in response to the Application filed on 09/05/2003.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "the speech" in line 1. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 1 recites the limitation "the data" in line 7. There is insufficient antecedent basis for this limitation in the claim.

8. Claims 2-4 are indefinite as being referenced upon an indefinite independent claim.

9. Claim 5 recites the limitation "the speech" in line 1. There is insufficient antecedent basis for this limitation in the claim.

10. Claims 6-10 are indefinite as being referenced upon an indefinite independent claim..

11. Claim 7 is indefinite as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention because the phrase "speech signal excepting the band having the maximum energy and the band having the minimum energy; and shaping the band with the maximum energy" is hard to understand as to what the applicant is trying to claim. For the purpose of examination, it has been interpreted that the maximum energy band is used for shaping.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cho *et al.* (US 6,233,551, 05/15/2001) in view of Swaminathan *et al.* (US 5,751,903, 05/12/1998) and Mano *et al.* (US 7,065,338, 06/20/2006).

As to claim 1, Cho *et al.* discloses an apparatus for shaping the speech signal in consideration of the energy distribution, comprising: an encoder (see Abstract) (e.g. A vocoder is similar to a encoder but a vocoder is a voice encoder) for receiving and encoding and unvoiced speech (see col.3, line 35), dividing it into a plurality of frequency bands (see Abstract) according to its characteristics, performing energy comparison of frequency bands (see col.5, Lines 41-48) (e.g. It should be noted that the autocorrelation of a signal is equivalent to the signal energy. A comparison is done with respect to threshold values as stated by the reference). However, Cho *et al.* does not

specifically disclose the use of energy intensity flags according to the energy comparison and background noise, the use of a decoder with shaping the speech signal. Swaminathan *et al.* discloses the use of flags for comparing the energies (see col. 11, lines 65-67). Further, Swaminathan *et al.* discloses the background noise being received and classified (see col. 5, lines 19-20). Neither, Cho *et al.* or Swaminathan *et al.* discloses the use of a decoder. Mano *et al.* discloses the use of decoder (see Fig. 12, section in dotted lined). It would have been obvious to one of ordinary skilled in the art to have combined the encoder as presented by Cho *et al.* with the background noise presented by and the energy intensity flags mentioned by Swaminathan *et al.* and with the decoder with shaping characteristics presented by Mano *et al.* The motivation to have combined these references include the reduction of signal bandwidth by the storing of speech in code. Further, the use of a decoder is needed to decode the speech signal for later retrieval with processing having been done on the signal from an encoder. The use of intensity flags allows a means to indicate a particular feature (see Swaminathan col. 11, lines 43-44) (e.g. The feature in this case is the energy values respective of each band.)

As to claim 2, Cho *et al.* discloses the encoder comprising, an FFT unit for receiving the speech signal corresponding to unvoiced speech and Fourier-transforming it, to obtain energy in the frequency domain of the speech signal (see Figure 2, elements 210 and 220) (e.g. It is inherent that the two elements use either a DFT or FFT to find the power, which is energy per unit time); an unvoiced energy comparator, dividing the unvoiced speech into a plurality of frequency bands according to its energy

distribution, carrying out comparisons of the energy bands (see col. 5, Lines 41-48). However, Cho *et al.* does not specifically disclose the background energy comparator. However, as applied in claim 1 above with the background noise presented by Swaminathan *et al.*, the background noise energy comparator would have been apparent at the time the invention was made to compare energy values for background noise in addition to voiced and unvoiced segments. The motivation to include a background energy comparator is the use of intensity flags allows a means to indicate a particular feature based on the energy values (see Swaminathan col. 11, lines 43-44) (e.g. The feature in this case is the energy values respective of each band.) Further, it is evident that within speech arises noise not relevant to speech, which has specific energy intensity as compared to speech segments and unvoiced speech (see Swaminathan col. 12, lines 6-15).

As to claim 3, Swaminathan *et al.* discloses the energy intensity flags set by the energy comparator comprise: a maximum energy flag (see Col. 12, line 6-10); a minimum energy flag (see Col. 12, line 6-10) (e.g. It is obvious that specific flags are set if they contain minimum energy depending on classification from the parameters); and an energy flag uniformly distributed (see Col. 12, line 6-10) (e.g. It is obvious that specific flags are set if they contain uniform energy distribution depending on classification from the parameters). It would have been obvious to one of ordinary skilled in the art to have categorized the flags as max, min or uniform depending on energy values. The motivation to have done such a method involves the selecting of the correct flag when the signal is of speech or non-speech.

As to claim 4, Mano *et al.* discloses wherein the decoder comprises: quantized gain information part of the input signal (see Figure 12, element 1306); a random number vector part (see Figure 12, element 1309 and col. 1, line 54-55) (e.g. The fixed adaptive codebook is generate from a random noise sequence); added to quantized gain information (see Figure 12, element 1310) (e.g. It is shown that the gains is multiplied and then the random (fixed codebook) and adaptive codebook (periodic sequence (speech) are added); a filter selector (see Figure 12, element 1310 and lcol. 6, line 35-38)) (e.g. It is inherent that the filter coefficients will change and a new filter created depending on parameters found) for distinguishing input signal; and a shaping unit (see Figure 12, element 1304 and col. 20, lines 60-64) (e.g. The shaping of the signal can also be interpreted as an improvement to the signal of choice in terms of quality) obtained by adding quantized gain information to the signal from random number part and input speech signal (see Figure 12, elements 1305-1310).

15. Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cho *et al.* (US 6,233,551, 05/15/2001) in view of Swaminathan *et al.* (US 5,751,903, 05/12/1998).

As to claim 5, Cho *et al.* discloses a method for shaping the speech signal on the unvoiced speech in consideration of its energy distribution characteristic comprising: Fourier-transforming the speech signal to obtain energy in its frequency domain (see Figure 2, elements 210 and 220) (e.g. It is inherent that the two elements use either a DFT or FFT to find the power, which is energy per unit time); determining whether the Fourier-transformed speech signal is an unvoiced speech or background noise, dividing

it into a plurality of frequency bands according to its frequency, and comparing energies of the divided bands (see col. 5, Lines 41-48). However, Cho *et al.* does not specifically disclose the use of energy intensity flags according to the energy comparison and background noise. Swaminathan *et al.* discloses the use of flags for comparing the energies (see col. 11, lines 65-67). Further, Swaminathan *et al.* discloses the background noise being received and classified (see col. 5, lines 19-20). It would have been obvious to one of ordinary skilled in the art to have combined the encoder as presented by Cho *et al.* with the background noise presented by and the energy intensity flags mentioned by Swaminathan *et al.* The motivation to have combined these references include the use of intensity flags allows a means to indicate a particular feature (see col. 11, lines 43-44) (e.g. The feature in this case is the energy values respective of each band.

As to claim 6, Swaminathan *et al.* discloses the comparing of energy bands differently divided according to whether the input signal is the unvoiced speech or background noise (see col. 11, lines 65-67), to find the maximum energy flag (see Col. 12, line 6-10); a minimum energy flag (see Col. 12, line 6-10) (e.g. It is obvious that specific flags are set if they contain minimum energy depending on classification from the parameters); and an energy flag uniformly distributed (see Col. 12, line 6-10) (e.g. It is obvious that specific flags are set if they contain uniform energy distribution depending on classification from the parameters). It would have been obvious to one of ordinary skilled in the art to have categorized the flags as max, min or uniform

depending on energy values. The motivation to have done such a method involves the selecting of the correct flag when the signal is of speech or non-speech.

As to claim 7, Swaminathan *et al.* discloses the comparing of energies of the plurality of bands and shaping the speech signal (see col. 14, lines 10-23) (e.g. The shaping of the signal is referred to speech signal quality enhancement. Further, weights are used for the parameters for the excitation predictor for shaping (see col. 1, lines 26-28) having the strongest energy band (see col. 12, line 4 and line 7) (e.g. It should be noted that a similar analysis can be done for unvoiced speech as presented by Cho *et al.* Further, the strongest energy band is referred to in this case as background noise).

As to claim 8, Swaminathan *et al.* discloses the shaping method comprising: comparing the energies of the frequency bands (see col. 11, lines 65-67) using a plurality of band signals (see Abstract), shaping (see col. 1, lines 26-28) the first band and also those that have a greater energy than the first band (see col. 12, line 4 and line 7) (e.g. It is inherent that the shaping will be done in comparison to the bands to see which has the strongest energy. It is also apparent that since the speech signal is being analyzed by frame, the flag referring to the strongest energy band will change and hence will be shaped).

As to claims 9 and 10, Swaminathan *et al.* discloses wherein interpolation is carried out for shaped bands (see col. 12, line 4 and line 7 and (see col. 1, lines 26-28) (e.g. background noise or unvoiced speech) with a filter parameter (see col. 4, line 52) (e.g. It should be noted that the parameters used for excitation include filter parameters

and are used for the shaping process) for particular bands (see col. 12, line 4 and line 7).

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The US 5,216,747, 5,960,388, and 7,016,832 is cited to teach a method for determining the unvoiced/voiced segments of a signal.

The US 6,496,798 is cited to tech and encoder and decoder for a low bit rate voice message.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paras Shah whose telephone number is (571)270-1650. The examiner can normally be reached on MON.-FRI. 7:30a.m.-5:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on (571)272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

P.S.

02/02/07

XIAO WU
SUPERVISORY PATENT EXAMINER